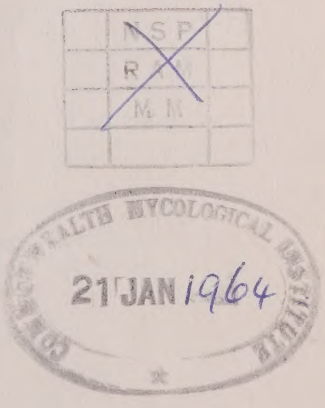
ANNUAL REPORT

OF THE

DIRECTOR OF AGRICULTURE

FOR THE YEAR

1958



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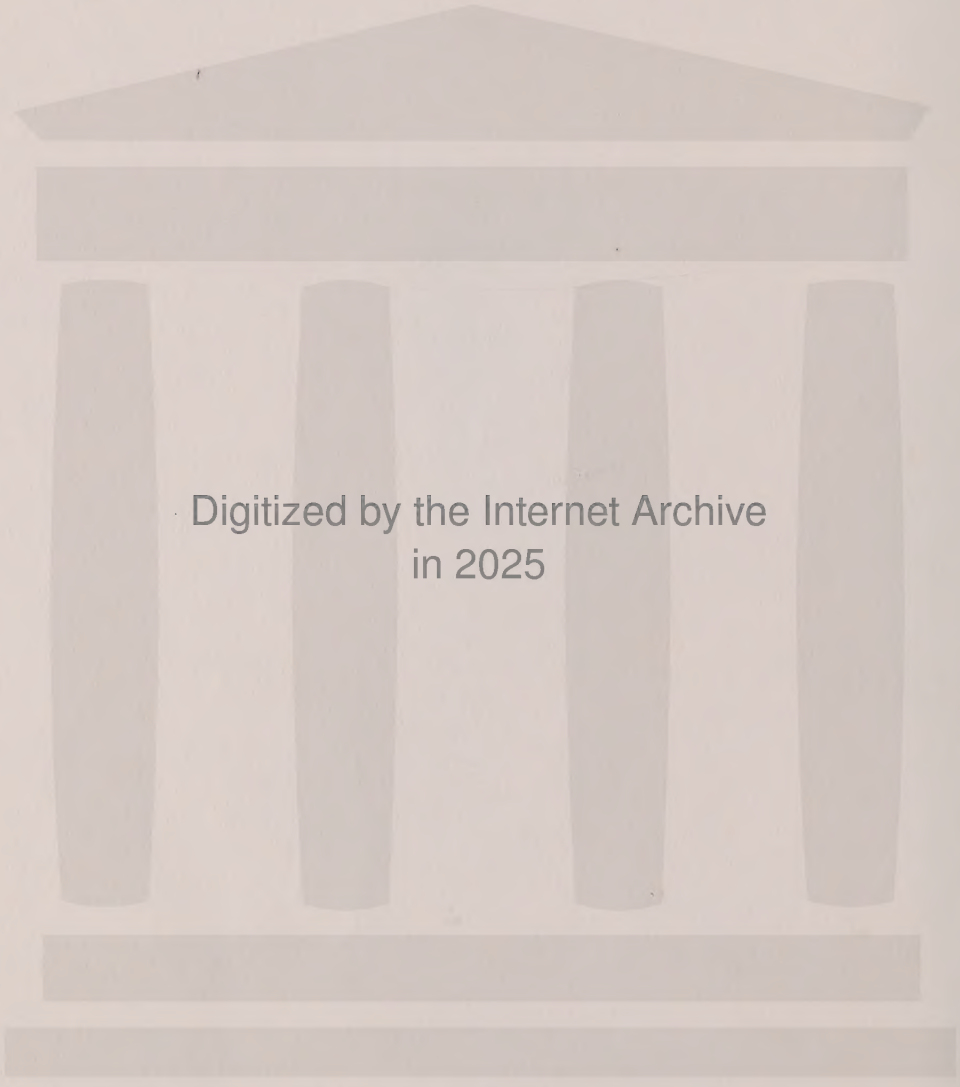

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REPORT

OF

The Director of Agriculture, 1958

The Chairman, Board of Agriculture:

I have the honour to submit a report of the Department of Agriculture for the year 1958.

I. AGRICULTURE IN 1958

The high rainfall was again the most outstanding feature of the weather during the year 1958. Records kept at the Botanical Gardens reveal a total rainfall of 86.71 inches for the year. The highest monthly precipitations were 14.21 inches in April, 11.95 inches in January and 10.27 inches in December. Only in the month of May was the rainfall less than two inches, when 1.76 was recorded. Fortunately the hurricane season passed without serious gale force winds, but the heavy rainfall in April and the south-east gale on the 16th April, caused considerable disruption in the arrangements for the Agricultural Exhibition opening on the following day.

Vegetable Production:

The production of vegetables declined somewhat during 1958 compared with the previous two years. During the year under review produce to the value of £49,000 was purchased by the Government Wholesale Marketing Centre compared with £57,000 in 1957 and £59,000 in 1956. This reduction was largely due to the lower yield of the potato crop. The 1957 autumn planting harvested in January and February, 1958 was well below the average yield, consequently the importation of table potatoes was not restricted until the 10th April.

The Bermuda Supplies Commission again co-operated with the Board of Agriculture by placing embargoes on the importation of vegetables when supplies of locally grown produce were in ample volume to fulfil local demands. New legislation was passed during the year giving the Governor-in-Council, on the recommendation of the Board of Agriculture, authority under the Importation of Fruits and Vegetables Act, 1958, to prohibit the importation of specified fresh fruit and vegetables into Bermuda during any particular period in any year. In future restrictions on imported produce will be enforced under this new Act.

Despite the placing of embargoes on fresh vegetables, the increasing use of canned and frozen vegetables is having a serious effect on the sale of fresh produce. Both the hotel caterer and the housewife finds the opening of a tin so much easier than preparing fresh vegetables for the table.

The Easter Lily Trade:

There was a further decline in the acreage of the Easter Lily. Only 15 acres were planted in 1958. The value of the flowers exported amounted to £16,674. compared with £34,000 the previous year. This gradual decline has been noted

now for several years, hence the formation of the lily improvement scheme by the Department of Agriculture some three years ago. The original stock selected to implement the scheme, sufficient to plant 30 rods has now been increased to over 100 rods. The continuous roguing has reduced the percentage of virus infested plants of this stock to a very low level. With proper care it should be possible to double the size of this stock within the next two years. In addition to the local stock of **Lilium longiflorum** var.**Harissii** and **L. longiflorum** var. **Howardi,** two Japanese varieties are being tested, namely, **Lilium longiflorum** var. **giganteum** (Takesima) and **L. longiflorum** var. **formosum** (Erabu).

Citrus Culture:

The yield of citrus fruit varied a good deal from orchard to orchard, but generally a heavy crop of grapefruit was reported from most growers. An embargo was placed on the importation of grapefruit effective from the 31st December, 1958. It is anticipated that supplies of this fruit will be adequate until April, 1959.

The Bermuda Citrus Growers' Association gave further consideration to a Marketing Scheme, and as a result recommended that all citrus fruit be marketed co-operatively through the Government Wholesale Marketing Centre. The Department of Agriculture presented a scheme whereby all fruit offered to the Wholesale Marketing Centre would be graded by the growers into four sizes of grapefruit, five sizes of oranges and two sizes of lemons. Seedless and seeded grapefruit to be separated, likewise the white fleshed and pink fleshed fruit. Several growers indicated their willingness to market their fruit under these conditions.

The Department experienced some difficulty in carrying out the first two citrus sprays. Rain and wind caused delays which threw the entire programme off schedule, with the result that it was impossible to complete the fifth spray before the end of the year. Control of the rust mite and of Melanose was generally poor in Pembroke and Paget parishes. The heavy rainfall undoubtedly was in large measure responsible for this.

Budded citrus trees continued to be in heavy demand. Some 3,000 trees were budded during 1958.

Dairying:

A survey of the dairy farms was conducted by the Government Veterinary Officer. This revealed that twenty-eight dairy farmers own 1,028 head of cattle. These dairy animals produced 611,424 gallons of milk during 1958. To maintain this milk production the dairy farmers use 685 acres of land for pasture, and the growing of fodder crops. Capital invested in the dairy farms, exclusive of real estate, is estimated at £124,600. Dairying continues to be the major farming activity, but the absorption of land suitable for dairy farming in the present enormous building programme is making it more difficult to maintain the present dairy herds on a declining acreage.

Poultry:

The production of eggs was maintained at approximately the same level as for the previous year, 40,000 laying birds produced 480,000 dozen eggs. Poultry meat production is beginning to fall. The largest single producer of poultry meat has virtually gone out of production and has transferred his energies and

capital to the more lucrative building trade. A recent survey of the poultry industry revealed that the poultry keepers have some £62,800 invested in birds and equipment.

The eighth annual Poultry Show was held in January under the auspices of the Bermuda Poultry Fanciers Society.

Other Animal Products:

During 1958 the Government Veterinary Officer inspected in the slaughter houses 1,488 carcasses of pork, 174 of veal and 166 of beef. In addition 18 goats were slaughtered for meat.

Although there is a ready sale for local honey interest in apiary culture continues to follow a downward trend.

II. REAFFORESTATION SCHEME - PARKS DIVISION

In presenting this report on the work accomplished under the Reafforestation Scheme it is fitting to reflect on the progress made during the last decade. The Reafforestation Scheme was commenced in January, 1949, by felling dead trees on Government property and on private estates at the expense of the property owners. In 1952 the Reafforestation Compulsory Powers Act was passed, and amended in 1955. This Act authorised the Department of Agriculture to fell trees along the roadside on all property to a depth of 100 feet from the roads. The Department was also empowered to plant areas where the trees had been felled with suitable plants. During the planting operations many pieces of Government land were encountered, and these areas were converted into small way-side parks, using a variety of ornamental trees, shrubs, palms and other plants. The parish Arbor Societies co-operated with the Department and assisted in various ways by maintaining areas of unkept land in a tidy and pleasing condition.

During this ten year period, dead trees have been felled on practically all of the Government land, many private estates and along the roadside to a depth of 100 feet. Considerable planting has been done in all of these areas, which is now beginning to show up to advantage. Possibly **Casuarina equisetifolia** has been planted too extensively but this tree has many advantages. It is a rapid grower, hardy and is evergreen. As times goes on it may be possible to eliminate some of the Casuarinas and replace them with other material, but the chief feature of this tree is its effectiveness as a wind break. This is a characteristic which is extremely important in Bermuda where damage to plant life from wind and salt spray is very extensive.

Felling Dead Trees:

Due to a concentrated effort in other directions less trees were felled during 1958. However, the whole of Ireland Island was cleared, likewise a large portion of the Prospect area. It is anticipated that by April, 1959, all the estate roads will be completed to a depth of 100 feet. During the felling operations, live trees were left, but as some of these died later, it has been necessary to go back over the cleared areas to fell these remaining dead trees. Some 13,890 trees were felled during the year.

Planting:

Over 8,000 plants were used in the various planting schemes.

Maintenance of Roadside Planting and Hedges:

Considerable time is spent in trimming hedges. Due to the narrow roads it is essential to prune the roadside hedges several times a year, to prevent the branches overhanging the roads and obstructing traffic.

Cases of vandalism are still being reported, but it is pleasing to note that the wilful destruction of plants by vandals is on the decrease.

Wayside Parks and Ornamental Planting:

Several new areas were developed as parks and picnic grounds during 1958. The most conspicuous area is the Trimingham Road in Paget. After the Public Works Department completed the new Trimingham Road with traffic roundabouts at either end, the Department of Agriculture planted these traffic circles with grass and petunias. A pleasing ornamental planting has been developed at either end of the road, due to the generosity of Sir Eldon Trimingham and his family in donating $1\frac{1}{2}$ acres of land to the Government for this purpose. Other areas developed during the year include Spanish Point, Pembroke and Mullet Bay, St. George's. Considerable work was undertaken at the Scaur Hill in Somerset and on Government land at the eastern end of Spittal Pond. These four areas will be valuable as picnic grounds and attractive open spaces to both tourist and resident.

The wayside parks were maintained by the Bermuda Landscaping Company, Ltd., and the School Grounds and Playing Fields by Mr. Norman M. Moniz, under contract with the Department of Agriculture. At the time of reporting the Department of Agriculture is responsible for the maintenance of 78 separate areas of Government land from St. George's to Somerset, with a total area of 120 acres.

In addition to these areas this Department is also responsible for the upkeep of the grounds of Government House, the Colonial Secretariat and the House of Assembly.

Easter Lily Plantings:

Eight areas of land were acquired in six parishes for the planting of 60,000 Easter Lily bulbs. These were planted in areas which can be seen from the main roads, for the benefit of tourists during 1959, as part of the 350th Anniversary celebrations.

III. ENTOMOLOGY, PLANT PATHOLOGY AND OTHER INVESTIGATIONS

The following summary of the reports of the Assistant Director and the Entomologist give an indication of the detailed investigations carried out during the year:

Mediterranean Fruit Fly, Ceratitis capitata Wied.

During 1957 and 1958, a concentrated effort has been made to reduce the Mediterranean Fruit Fly population in Bermuda. This has been done by trapping, and the application of foliar and ground sprays. In these two years a

total of eighteen thousand males were caught and destroyed in traps. The traps are baited with angelica seed oil which contains DDVP as the toxic agent. Foliar sprays contained malathion and a protein bait. Dieldrin was used in ground spraying.

Trapping indicates that the fly population was greatly reduced in 1958 over 1957, the first year for a long period where consistent trapping was carried out. This is thought to have been brought about by the different control activities exercised in these two years. No damage to citrus by fruit fly was recorded in 1958.

Field observations and records have established some very interesting points in the habits and activities of the flies. Fly populations rise sharply in citrus orchards approximately two weeks after ripening of the wild surinam cherry crop. June and July are the peak months of fly abundance in the orchards. In 1958, concentrations were noted in two parishes, namely, Paget and Warwick. Two-thirds of the flies trapped were captured on one property, "Sleepy Hollow," Warwick. Small numbers were trapped in seven of the nine parishes in Bermuda. No flies were taken in Hamilton and St. George's parishes. Captures made in isolated areas could usually be traced to peach trees growing in the vicinity.

There is every reason to believe that a continuation of the present control programme will result in a steady diminution of the Mediterranean Fruit Fly problem.

Gibberellic Acid to Induce Sprouting of Potato Tubers:

Further tests were conducted with the plant growth stimulant, gibberellic acid, in an effort to determine if this material could be safely used to encourage sprouting of seed potato pieces. In Bermuda, it is the practice to dip Canadian seed potatoes, planted in the autumn, in an ethylene chlorohydrin solution to induce early sprouting. This material is highly toxic and a safer method is urgently needed.

In October of the current year, plots were set up (in triplicate) using potato pieces dipped in a gibberellic acid solution of 1 ppm. 2.5 ppm. and 5 ppm. Similar plots using ethylene chlorohydrin (12 ounces of the 40% material to 4 gallons of water) were included in the test, and three check plots. At all strengths, tubers treated with gibberellic acid produced many spindley shoots, more particularly at the higher concentrations. In contrast the shoots produced by tubers treated with ethylene chlorohydrin, and the untreated sets, were strong in appearance and vigorous in growth.

Despite the above, it is felt that gibberellic acid may yet have a place in Bermuda's potato production programme. More attention will have to be given to the proper dilution of the chemical. It is felt that the degree of "greenness" on the tuber treated has a very definite bearing on the result. This point will be further studied.

Control of Land Crabs:

During the summer of 1958, a full-scale field test was made to appraise the effectiveness of a recent recommendation for the control of land crabs **Gecarcinus lateralis.** This recommendation consisted in treating individual burrows

with a bait composed of bran, dieldrin, salt and water. This work was carried out, chiefly, at the "Old Battery" in Tucker's Town, Hamilton Parish. Some interesting results were secured:

1. Approximately 60% of the crabs in a treated area are killed in one or two days. The majority of the 40% can be expected to die after two or three weeks, inactivity in the burrows. Total kill approximates 85-95%.

2. The results secured are practically as good where the bait is broadcasted, as where individual holes are treated.

3. Two baitings of any given area during the summer months are recommended.

4. The amount of dieldrin recommended ($\frac{1}{2}$ lb. to 20 lbs. of bran) was found to be about optimum.

Some interesting, and valuable, observations were made on the biology and habits of **Gecarcinus lateralis.**

Biological Control Projects:

During 1958, introductions of six species of parasites and eight species of predators were made by the Commonwealth Institute of Biological Control under the supervision of Dr. F. J. Simmonds, Director. These were designed to assist in the control of the Oleander Scale **Pseudaulacaspis pentagona,** and Green Shield Scale **Pulvineria psidii,** the White Fly on Fiddlewood **Metaleurodicus cardini** and the Edible Snail **Otala lactea.**

As far as can be learned, none of these parasites, or predators, had any appreciable effect on host abundance. This may have been due, in part, to weather conditions as the winter of 1957-58 was an unusually severe one, being characterized by gale force winds, abnormally heavy precipitation and unusually low temperatures.

In an effort to reduce the numbers of two species of lizards (**Anolis grahami** and **Anolis leachi**), which have been held responsible for the disappearance of many introduced parasites and predators, 200 Kiskadees **Pitangus sulphuratus** were brought into Bermuda from Trinidad in 1957. These birds have been kept under careful study by a trained ornithologist, Mr. David Wingate, during the last two years. Six nests were kept under observation in 1958, two of which are known to have produced young. There were probably others. It is estimated that at the end of the present year there were 70 kiskadees present in the Colony. This is, of course, merely an approximation. What the fate of these birds will be is quite uncertain but they will have to increase much more rapidly than they have in the past, if they are to have any appreciable effect on the lizard population.

Herbicides:

A three-year study to devise a method of controlling Oxalis (**Oxalis** sp.), one of Bermuda's most troublesome and persistent weeds, was completed early in 1958. It was learned that two sprays of the weed-killer Kuron, interspersed by a single cultivation, will kill 95-98% of these plants. Kuron, which is a product of the Dow Chemical Company, was used in 2% sterngth. The first application was made in the autumn, when oxalis was in the first flush of growth, followed by a thorough cultivation a month later. When the second growth of

oxalis appeared, this crop arising from the dormant bulbs present in the soil at the time of the first spraying, a second application of Kuron was made. Planting of any crop one month after the second treatment was found to be safe and practical.

A Government pamphlet, "Oxalis — How to Kill It," was published in February for the guidance of farmers and gardeners.

Slugs and Snails:

Field trials were carried out with a new slug and snail remedy against different species common to Bermuda. This material, sold under the trade name of Slugdusto, contains metaldehyde as the toxic principle and is manufactured by the Miller Products Company of Portland, Oregon, U.S.A. It was found to be extremely effective against the giant slug, **Amalia gagates** and young, and half-grown, specimens of **Otala lactea.** However, it failed to kill the spiral snail, **Achatina** sp.

Through the co-operation of the Commonwealth Institute of Biological Control, introductions of the predaceous snail **Euglandina rosea** were made in January and March. 250 adults of this mollusc were brought into Bermuda from Trinidad and Hawaii and liberated at four points, where an abundance of snails of different species was known to occur. It is interesting to note that two partially-grown specimens of **Euglandina rosea** were recovered at one of the points of liberation twelve months later. These must have been the progeny of adults previously liberated. A laboratory study, dealing with the life history and habits of **Euglandina,** was carried out during the winter months.

Bulb Mite, Rhizoglyphus solani:

Bermuda lilies are very frequently infested with all stages of the bulb mite. They feed, chiefly, on the tips of the scales, or shells, which turn black. Very often the feeding of this mite changes the colour of the bulbs from golden yellow to dark brown, reducing their saleability. Infested bulbs are weakened by the attack of these acarids.

An effort was made to work out a control for this pest. Many miticides, and one fumigant (methyl bromide), were tested over a series of years, including the year of report. Of these, a dip of corrosive sublimate (mercury bichloride), was found to be the most effective. This was used in a dilution of 1-3200, with water, and the bulbs immersed for a period of half an hour at a temperature of 70 F. This kills all stages of the mites, including the eggs. The treatment seems to have no ill effect on the bulb, sprouting and growth being quite normal. However, plants originating from treated bulbs have not, as yet, been followed through to the flowering stage.

The Herbarium:

During 1958, a start was made toward building up a herbarium to include specimens of the native plants of Bermuda. Collections of many species were made throughout the summer which were pressed, mounted and suitably labelled. Many of these could be identified at sight, but, where any doubt existed, specimens were submitted to specialists abroad for determination. This activity will be continued through the years ahead with a view to, eventually, including in the herbarium a complete collection of Bermuda plants.

Spraying Service:

The two mechanical sprayers operated by the Department of Agriculture were kept busy throughout the year attending to the requests of farmers and citrus growers for spraying service.

More gallons of spray material were applied to fruit crops in 1958 than in any year since the service, with truck mounted sprayers, was begun. Fireworms, **Xylomiges eridania** and Cutworms, **Prodenia ornithogalli,** were a constant source of worry to farmers and frequent spraying of vegetable crops was necessary to prevent serious damage being inflicted by these pests. During the year under report 202,112 imperial gallons of spray were applied to citrus trees, farm crops and ornamentals.

Cost of Production of Locally Grown Potatoes:

An increasing number of complaints from local farmers over the high costs involved in producing local potatoes led the Assistant Director to keep accurate records of these costs during 1958.

Figures obtained from three farmers indicated that the cost of production of potatoes per acre varies from £120 - £180. It is unlikely that production costs could be lowered much below the £120 figure. This means that a yield of $3\frac{1}{2}$ or 4 from 1 has to be obtained if the production costs are to be recovered.

A yield of 4 from 1 is difficult to achieve from the fall potato crop in Bermuda. Short day length coupled with wind damage are serious handicaps. The use of imported seed for the autumn planting often reduces the farmer's chances of making a profit, since Canadian seed does not arrive in time to allow early planting, and crops maturing from seed planted in October are very vulnerable to January gales. If better records of expenses were kept by local farmers, it is more than likely that many growers would discontinue the practice of planting imported seed potatoes during the autumn.

The opinion is expressed that a concerted effort should be made to establish a local seed potato certification scheme which would be of sufficient magnitude to provide the majority, if not all, of the seed potatoes required for the autumn planting.

Certification schemes have been begun in the past but never on a large scale — primarily because of lack of available storage space in which to hold the seed from the time of digging in the spring, until the autumn. With the additional storage space now available, the Department of Agriculture is in a much better position to undertake a certification scheme.

A properly organised certification programme, would be a tremendous aid to local farmers. There would then be available an adequate supply of reliable seed which could be planted during September. These early plantings would be much more likely to produce a profitable crop and in so doing would guarantee the continuance of the long established practice of planting both an autumn and spring crop of potatoes in Bermuda.

IV. HORTICULTURE

The Horticultural activities of the Department of Agriculture continue to expand in many directions. The Horticulturist and the Reafforestation Officer accomplished a great deal of exceedingly valuable work throughout the year.

Botanical Gardens:

On the 17th April, 1958, His Excellency the Governor, Lt.-General Sir John D. Woodall, K.B.E., C.B., M.C., officially renamed the Agricultural Station, as The Bermuda Botanical Gardens.

A former Director of Agriculture, Mr. E. A. McCallan, first mooted the development of a Botanical Garden within the Department of Agriculture in 1926. From that time onwards the Agricultural Station has been gradually changed and embellished with plants from many regions of the world. Each Director and Horticulturist added his own ideas. The Gardens, therefore, reached a stage where the name could advantageously be changed. During the summer of 1958 the south plots previously used as a vegetable trial ground, were converted into a formal garden. A stone wall was erected along the southern side with a flight of steps leading from the main drive into the garden. The design was fashioned after an old English Iris Garden with a Bougainivilla hedge surrounding the formal beds. The main feature of the first season's planting is the Easter Lily with beds of the spring flowering annuals to give colour and variety. A sundial will be erected in the centre of this garden to commemorate the 350th Anniversary of Bermuda — 1609 to 1959.

Other improvements are contemplated. These include a garden for the Blind; a large double herbaceous border backed with flowering shrubs; and a rose garden, which will include some of the old-fashioned varieties of roses which thrive in Bermuda.

Montpelier Arboretum:

This area of some twenty-two acres in Devonshire, bordered by the Montpelier Road, the Middle Road and the Fort Road, was handed over to the Department of Agriculture in 1953. Since then the work has been steadily progressing on the development of the area as an arboretum. Considerable planting has already been done in accordance with a pre-arranged plan. The whole area is beginning to shape up exceedingly well and in a few years should be another of Bermuda's show places.

Tula Valley, Admiralty House:

The development of the kitchen garden of Admiralty House into a plant nursery has progressed very satisfactorily. The slat house, built of cedar by Department of Agriculture employees, 250 ft. in length and 35 ft. wide was completed during the year. This house is now filled with ornamental plants.

Nursery Work, including Citrus Propagation:

The stock of plants held in the nursery in October, 1958, amounted to 47,193. Many new species were introduced. During 1958, 24,000 plants were despatched from the plant nursery. Over 8,000 of these were used in the Parks division, while the remainder were either sold to the general public or donated to Arbor Societies or similar organisations.

The propagation of citrus trees involves a great deal of labour and personal attention on the part of the Reafforestation Officer. Over 3,000 citrus trees were budded in 1958. The majority of these will be sold during the early part of 1959.

Trial Plots:

The limited vegetable trials are now conducted on arable land adjoining "Avocado Lodge," "Clifton" and the "Laurels" in Devonshire.

Advisory Service:

Numerous requests continue to be received for advice on all aspects of gardening in Bermuda. The Horticulturist spends the larger part of his time in carrying out these advisory visits.

School Gardening:

Gardening classes were conducted by the Horticulturist in several schools throughout the year. Again the St. George's Secondary School received special attention where the results were most encouraging.

Arbor Societies:

The Arbor Societies continue to be active in St. George's, Hamilton, Smith's, Paget, Warwick, Southampton and Sandys Parishes. Assistance was given in the form of funds, plants and labour.

V. ANIMAL HUSBANDRY

Control of Animal Diseases:

Of the 1,224 dairy cattle tested for tuberculosis in 1958 the Government Veterinary Officer reports that no animal reacted to the test. It is, therefore, pleasing to record that for the last two years the dairy herds have been proved to be free from tuberculosis. A breakdown of this figure of 1,224 dairy cattle shows that 927 animals examined are owned by the dairy farmers and 289 are privately owned. Eight animals were retested at the request of the purchaser before introducing them to a dairy herd.

In the case of Bangs disease 181 calves and 16 adult animals were vaccinated.

A total of 110 pigs were vaccinated with anti-hog cholera during the year. The Government Veterinary Officer reports that no symptoms of cholera were seen in any of the post-mortem examinations of the 1,488 carcasses inspected in the slaughter-houses.

Foot-rot was again observed in a number of dairy herds.

Photosensitization is causing some concern amongst cattle owners. The cause of the malady is still unknown, hence the Government Veterinary Officer conducted several feeding experiments to determine if the condition can be brought about by the animal eating certain kinds of plants. No conclusive results were obtained. While plants have been thought to cause the trouble it may well be a fungus or even aphids on the fodder eaten by the cattle. Further tests are being made.

Control of Flies in the Dairy Farms:

An experiment was conducted on the control of flies in the dairy farms. A fly bait containing DDVP and 1% malathion has proved effective. This, used in combination with proper manure pits, would undoubtedly assist in reducing the fly population.

Improvement of Livestock:

One farmer applied to the Board of Agriculture for assistance to import a pedigree bull during 1958, which was granted. Some 58 head of dairy cattle were imported by individual farmers to help maintain the high quality of cattle already in the Island.

VI. WHOLESALE MARKETING CENTRE

Produce to the value of £49,000 was purchased by the Wholesale Marketing Centre which was £8,000 below the 1957 figure. The potato crop, 20,212 bushels, was 4,210 bushels less than the previous year and 8,000 bushels below the 1956 yield.

The following table shows the value of the purchases made each year during the ten year period since the introduction of Planned Production and Marketing Scheme in 1949.

1949	£16,585
1950	24,392
1951	34,075
1952	38,644
1953	34,553
1954	33,726
1955	47,326
1956	59,630
1957	57,000
1958	49,000

The Cold Storage Plant at Prospect was rented from the Crown Lands Corporation for the storage of potatoes. This is an ideal store for this purpose.

Two stall holders operated the retail section of the Marketing Centre throughout the year.

VII. AGRICULTURAL EXHIBITIONS

The twenty-third Agricultural Exhibition was held on the 17th, 18th and 19th April, 1958. This again proved to be a very popular undertaking. but the inclement weather on the 16th April and the following day severely hampered the staging of the floral and vegetable exhibits. As is shown on the following table the attendance, obviously due to the weather, was small compared with the earlier years.

Year	Exhibitors	Entries	Paid Admissions
1955	305	2,000	9,957
1956	385	2,450	14,400
1957	391	2,486	10,500
1958	454	2,585	7,800

Annual Citrus and Poultry Show:

The Annual Citrus Exhibition and Poultry Show was held jointly at the Botanical Gardens under the auspices of the Citrus Growers Association and the Poultry Fanciers Society during the month of January.

VIII. EXTENSION WORK

Publications:

The monthly Agricultural Bulletin continued to serve a very useful purpose. The circulation is now over 600 copies per month. Other departmental publications in 1957 include:

"Oxalis — How to Kill It"
by A. G. Dustan.

"The Oleander Scale **Pseudaulacaspis pentagona** (Targ.) (Homoptera Coccidae) in Bermuda"
by F. J. Simmonds.

Lectures and Demonstrations:

Lectures were given by members of the Staff to the Arbor Societies, The Garden Club and other organisations on agricultural and horticultural topics.

Full advantage was again taken of the time made available by the Bermuda Broadcasting Company every second Wednesday of the month. Members of the staff of the Department discussed a variety of topics in these talks.

IX. FINANCIAL

From the financial statement Appendix "B", compiled from records kept at the Department of Agriculture, it will be observed that the total allocation of funds for 1958 was £176,719, of which £173,123 was spent. Departmental receipts, including the resale of vegetables purchased through the Wholesale Marketing Centre and monies received for services rendered to the public, amounted to £58,965 as at Appendix "A". If the receipts be deducted from the total expenditure the actual operating cost of the Department of Agriculture for 1958 was £114,158. Appendix "C" shows the actual cost of the Wholesale Marketing Centre.

X. ACKNOWLEDGEMENTS

It is a pleasure to record my grateful appreciation to the Chairman and members of the Board of Agriculture for their valuable help and guidance throughout the year.

I would also like to express my thanks for the opportunity offered me while on leave of absence during the summer months to visit the Maritime Provinces of Canada in connection with the inspection of seed potatoes during the growing season. My attendance at the Conference of Directors and Senior Agricultural Officers of Overseas Departments of Agriculture held at Wye College, Kent, England, during September, was indeed a valuable and enlightening experience.

To the members of the Staff of the Department of Agriculture I would like to again express my sincere thanks for the very efficient manner in which they executed their many and varied duties. I also express my thanks to the members of the many organisations connected with agriculture and horticulture, all of whom assisted me in a great many ways.

Respectfully submitted,

GORDON R. GROVES,
Director of Agriculture.

25th February, 1959.

APPENDIX "A"

Summary of receipts for year 1958

Vote 2	(a)	Marketing Centre	£47,699 13 6
2	(b)	Service to citrus growers	4,272 1 0
2	(c)	Reafforestation services	2,927 18 5
2	(d)	Other receipts	4,066 3 10
			£58,965 16 9

APPENDIX "B"

Expenditure for period 1st January to 31st December, 1958

Vote	Service	Amount of Vote	Expenditure	Balance Lapsing
		£ s d	£ s d	£ s d
1	Fees to members of Board	250 0 0	152 8 0	92 12 0
2 - 14	Salaries	11,750 0 0	11,225 1 0	524 18 6
15 - 16	Bonus on Salaries	1,069 0 0	937 5 4	131 14 8
17	General Grant	5,000 0 0	4,804 10 6	195 9 6
18	Control of animal diseases and improvement of livestock	1,500 0 0	1,490 4 11	9 15 1
19	Control of plant diseases and pests	6,000 0 0	5,865 16 10	134 3 2
20	Horticulture	3,000 0 0	2,952 1 2	47 18 10
21	Government House gardens	3,300 0 0	3,055 9 5	244 10 7
22	Departmental contingencies, travelling expenses, etc	400 0 0	322 9 6	77 10 6
23	Packing House supplies and marketing investigation	1,000 0 0	407 1 8	592 18 4
24	Cold storage plant operation	4,500 0 0	3,969 3 10	530 16 2
25	Upkeep and operation of agricultural equipment and motor vehicles	4,500 0 0	4,498 1 9	1 18 3

Continued

Vote	Service	Amount of Vote	Expenditure	Balance Lapsing
		£ s. d.	£ s. d.	£ s. d.
26	Purchase of agricultural and reafforestation machinery and equipment	2,000 0 0	1,875 7 11	124 12 1
27	Purchase and storage of agricultural supplies	600 0 0	521 12 11	78 7 1
28	Purchase and storage of potatoes and other agricultural produce for resale	50,000 0 0	49,962 6 4	37 13 8
29	Agricultural exhibitions	3,000 0 0	3,000 0 0	
30	Biological control and agricultural research	5,000 0 0	4,921 11 10	78 8 2
31	Reafforestation and roadside planting and maintenance of public parks and gardens	68,000 0 0	67,719 3 9	280 16 3
32	Publications	400 0 0	369 1 2	30 18 10
33	Agricultural and horticultural extension work and agricultural education	750 0 0	586 7 1	163 12 11
34	Grant to Arbor Societies	200 0 0	196 0 0	4 0 0
35	Maintenance of school playing fields	4,500 0 0	4,292 0 0	208 0 0
		£176,719 0 0	173,123 5 5	3,595 14 7

APPENDIX "C"

Statement of Expenditure and Receipts of Wholesale Marketing Centre

Expenditure

Salaries of Marketing Officer and Assistant	£1,650 0 0
Operation of Cold Storage Plant, labour, rent and electricity	3,969 0 10
Purchase of vegetables for resale	49,962 6 4
	£55,581 10 2

Receipts

Sale of vegetables in 1958	£47,699	13	6
Stock in hand, 31st December, 1958	1,455	15	0
Outstanding accounts, 31st December, 1958	2,611	4	0
	51,766	12	6

APPENDIX "D"

Summary of Land Usage

Vegetable Crops	660 acres
Fruit Crops	80 "
Flower Crops	30 "
Pasture Land	625 "
Fodder Crops	60 "
Bare fallow	100 "
	1,555 "

APPENDIX "E"

Production of Ground Crops, Animal Products and Livestock Population

Vegetables	Area under crop expressed in acres	Average yield per acre in lbs.	Total yield in lbs.	Unit Value	Farm Value
Beans	30	4,000	120,000	1/6d	£ 9,000
Beets	10	8,000	80,000	7d	2,333
Broccoli	15	2,500	37,500	1/6d	2,872
Cabbage	45	10,000	450,000	7d	13,125
Carrots	50	12,000	600,000	8d	20,000
Onions	15	10,000	150,000	8d	5,000
Potatoes, Irish	240	8,000	1,920,000	6d	48,000
Potatoes, Sweet	45	8,000	360,000	6d	9,000
Tomatoes	40	9,000	360,000	1/4d	24,000
Miscellaneous	50	8,000	400,000	7d	11,606
Bananas	120	10,000	1,200,000	8d	40,000
	660	5,277,000	5,677,500		£184,936

Citrus

Area under cultivation in acres	No. of trees	Average yield per tree in dozens	Total Yield in dozens	Unit Value	Farm Value
80	8,000	15	120,000	5/0	£30,000

Lily Bulbs and Flowers

Area under cultivation in acres	No. of bulbs planted	No. of bulbs exported	No. of boxes of flowers exported	Value
15	600,000	NIL	5,838	£16,674

Animal Products

Milk

Total production expressed in gallons	Unit Value	Value
611,424	5/8	£173,236

Meat Products

Beef in lbs.	Value	Veal in lbs.	Value	Pork in lbs.	Value	Poultry in lbs.	Value
66,400	£4,980	17,400	£1,305	222,450	£22,425	100,000	£15,000

Eggs

Expressed in dozens	Unit Value	Value
480,000	5/-	£120,000

Dairy Animals

Cows	Heifers	Bulls	Total
1,039	223	50	1,312

Horses

Farm and Truck	Carriage	Saddle Horses	Race Horses	Ponies	Total
94	41	20	25	20	200

Pigs

Sows	Boars	Store Pigs	Piglets	Total
350	55	1,100	1,850	2,355

Goats — 340.